

MEMORANDUM



Date: July 8, 2013

To: Anne Henning, Senior Planner, City of Moses Lake

From: Amy Summe, Environmental Planner and Sarah Sandstrom, Fisheries Biologist

Project Number: 130419

Project Name: Cumulative Impacts Analysis of the City of Moses Lake's Shoreline Master Program

Subject: Recommendations to Meet No Net Loss of Ecological Functions in the City's Shoreline Master Program

The City of Moses Lake's proposed Shoreline Master Program (SMP) includes many provisions that help maintain shoreline ecological functions and avoid land use conflicts. However, an analysis of the cumulative impacts of the SMP found that proposed standards relating to residential shoreline buffers, wetland buffers and mitigation ratios, docks, and the Shoreline Residential - Dunes Area environment are not sufficient to ensure no net loss of ecological functions on a city-wide basis. The purpose of this memorandum is to provide suggestions for modifications to the SMP to meet the 'no net loss' standard. Suggested modifications in this memorandum should not be interpreted as the *only* means to achieve no net loss of shoreline functions.

Residential Shoreline Buffers

In order to ensure that residential shoreline buffers will maintain existing vegetative, habitat, and water quality functions, proposed buffers should be consistent with existing conditions. Where existing conditions are predominantly undeveloped or where existing development has maintained broad buffer areas, larger buffers may be necessary than are proposed. The following recommended buffers account for existing conditions (see Table 6-1 in the Cumulative Impacts Analysis), and would ensure that shoreline buffer functions are maintained as residential development and redevelopment occurs (Table 1). See Figure 1 for an illustration of the basic elements of the recommendations.

Table 1. Summary of widths of residential shoreline structural setbacks and undisturbed shoreline vegetation by environment designation and shoreline analysis reach.

Shoreline Designation Analysis Reach	Mean Structural Setback Width (ft)	Mean Undisturbed Vegetation Width (ft)	% Vacant by Parcel	Recommendations
Shoreline Residential				
8	71	5	15%	Maintain 25-foot buffer. Could allow for specific accessory structures (e.g., pervious patio) in the outer half of the buffer.
15	58	15	12%	
19	83	12	0%	
28	46	14	8%	
Shoreline Residential – Resource Area				
20	64	6	16%	<ul style="list-style-type: none">• Maintain 25-foot buffer.• Apply a minimum setback to protect private property owners’ views and property values.
4	120	9	20%	
17	105	12	19%	
21	66	14	16%	
18	73	15	0%	
24	147	15	21%	
8	130	19	10%	
14	28	20	67%	
6	82	26	31%	
2	135	27	43%	
26	65	27	50%	<ul style="list-style-type: none">• Apply a 50-foot buffer.• Consider incentives.• Apply a minimum setback to protect private property owners’ views and property values.
3	139	34	18%	
16	81	38	49%	
1	110	45	36%	
29	92	48	27%	<ul style="list-style-type: none">• Apply a 50-foot buffer and require a 10-foot-wide undisturbed vegetation habitat corridor perpendicular to the lakeshore when they would connect an existing critical area, priority habitat, or other native habitat to the lake. Where those upland habitats are not present, apply a 100-foot-buffer.• Consider incentives that would allow limited development in outer portion of the buffer.• Apply a minimum setback to protect private property owners’ views and
5	96	71	44%	
30	89	82	29%	
19	168	96	24%	
7	172	119	21%	
23	315	162	11%	
31			100%	
32			100%	

Shoreline Designation Analysis Reach	Mean Structural Setback Width (ft)	Mean Undisturbed Vegetation Width (ft)	% Vacant by Parcel	Recommendations
				property values.
Shoreline Residential - Special Resource Area				
4			100%	<ul style="list-style-type: none"> • Apply a 150- to 200-foot buffer. • Where existing development exists, apply a minimum setback to protect private property owners' views and property values.
5	266	200	63%	
10			100%	
21	223	180	58%	
24			100%	

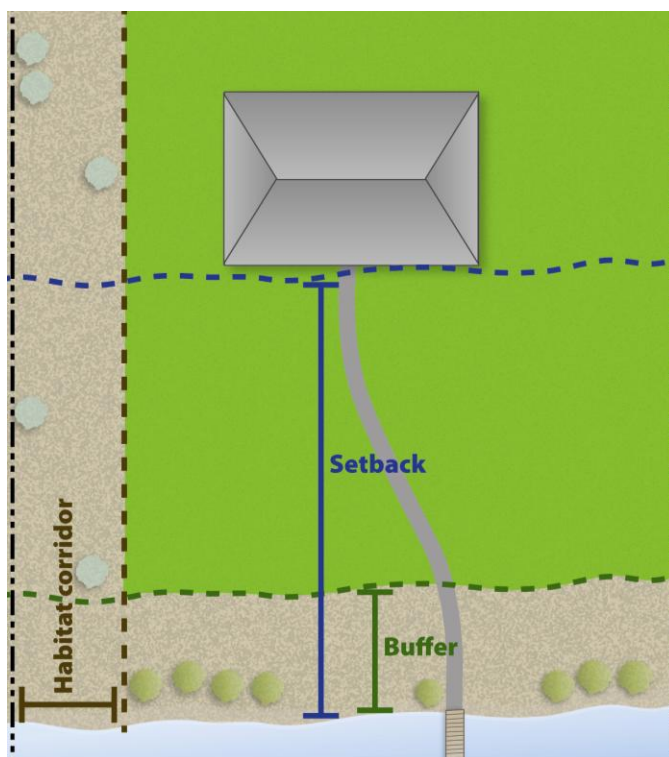


Figure 1. Diagram of buffer and setback recommendation elements.

The proposed residential shoreline buffers in the Shoreline Residential-Resource environment in Table 1 are split into three separate areas reflecting differences in the intensity of existing development. Distinct management recommendations

are provided for each of the three separate areas in Table 1. Alternatively, if the City wishes to maintain a single residential shoreline buffer standard for the entire Shoreline Residential-Resource Area environment designation, a 50-foot buffer would account for the mean width of existing undisturbed vegetation on developed lots for the entire environment designation. Under this alternative, presumably, some areas would receive regulatory protection exceeding the immediately surrounding conditions, while regulations would be more permissive than surrounding conditions in other areas. The loss of functions in one area could be thought to offset the improvement in functions in another area. If this alternative approach were implemented, the City would need to account for and maintain the upland corridors that presently exist in the less developed areas of the City and its UGA. We would also recommend a requirement for an undisturbed habitat corridor perpendicular to the OHWM (see Figure 1 above). These habitat corridors would be appropriate when they would connect an existing critical area, priority habitat, or other native habitat to the lake.

There is the potential to incorporate incentive options in any designation where a landowner could implement a reduced buffer if certain actions are taken to improve ecological functions. In the City of Moses Lake, viable incentives to improve shoreline function despite a reduction in buffer width may include planting native emergent vegetation, maintaining a vegetation corridor perpendicular to the shoreline, implementing low impact development and stormwater filtration, removing existing shoreline stabilization, and/or removing other in-water structures. Two examples of potential incentive options are attached as Appendix A (City of Chelan and Bothell¹).

Residential Shoreline Setbacks

On many areas of the City of Moses Lake's shoreline, existing residential development is set back up to 200 feet from the shoreline. These development patterns may be associated with topography, road and utility access, other critical areas, or historic development patterns. Despite being set back from the shoreline, the property values of existing residential uses are intimately tied with the views of the Lake that they afford. In many of these areas, continued infill development is anticipated. If new, adjacent development is allowed significantly closer to the lakeshore, it could adversely affect property values of neighboring, existing, developed lots. Shoreline structural setbacks can provide a means to ensure that new development does not interfere with the views and property values of existing development. A specific value could be assigned for

¹ Any use of these examples would need to be customized to the City of Moses Lake's specific lakeshore ecological needs, conditions, and buffer strategy.

shoreline setbacks based on the general character of an area, a proportion of lot depth (establishing maximums and minimums to account for particularly small or large lots), or the stringline approach, where the setback is the mean of the setback of adjacent structures on either side of the proposed development. Shoreline structural setbacks can also help limit the proximity of pollutant-generating surfaces and activities to the shoreline and ensure that buildings and associated uses are not encroaching on the buffer area.

Wetland Buffers

In order to ensure that Category III and IV wetland buffers will maintain existing vegetative, habitat, and water quality functions, proposed buffers should either be: 1) consistent with existing conditions, or 2) consistent with recommendations of the “most current, accurate, and complete scientific and technical information available that is applicable to the issues of concern” (WAC 173-26-201(2)(a)). Where existing conditions are predominantly undeveloped or where existing development has maintained broad buffer areas, larger buffers may be necessary than are proposed.

Existing Conditions

In order to ensure that future conditions under a proposed SMP will be consistent with existing conditions, at a minimum an aerial photo analysis of the known Category III and Category IV wetlands in shoreline jurisdiction would be required, along with documentation of their functioning buffer widths. Table 5-3 of the Cumulative Impacts Analysis provides a summary of 23 wetlands, 21 of which are Category III and IV. As noted in the CIA, the proposed wetland buffers do not support “no net loss of ecological functions.”

A possible solution to better align the existing conditions for Category III wetlands with the assignment of buffers is provided below (Table 2). Note that data is not available for wetlands in all designations and the sample sizes are relatively small. Accordingly, a recommendation for departure from the strictly science-based buffer standards is only provided for Category III wetlands in the Shoreline Residential – Resource Area designation. If the Shoreline Residential designation were merged with Shoreline Residential – Resource Area designation, the following recommendation would likely still be applicable.

The data do not support any alternative recommendations for Category IV buffers, although that could change if more data was collected and the sample size increased. With current information, the average functioning buffer width for Category IV wetlands is approximately 50 feet.

Table 2. Potential alternative wetland buffers for Category III wetlands.

Wetland Category Environment Designation	Standard Buffer Width	Additional buffer width if wetland scores 21-25 habitat points	Additional buffer width if wetland scores 26-29 habitat points	Additional buffer width if wetland scores 30-36 habitat points
Category III				
Shoreline Residential - Resource	25 ft ¹	Add 10 ft ²	Add 50 ft ³	NA
Other Designations	60 ft	Add 30 ft	Add 60 ft	NA

¹ The averaged existing functioning buffer width for Category III wetlands with less than 21 points was 24.5 feet.

² Based on a sample size of 1 wetland, the existing functioning buffer width for the Category III wetland with 21 habitat points ranged from 16 to 30.

³ Based on a sample size of 1 wetland (across ~18 parcels), the existing functioning buffer width for the Category III wetland with 29 habitat points averaged approximately 75 feet.

Scientific Information

Alternatively, the following buffers from Ecology's *Wetlands & CAO Updates: Guidance for Small Cities Eastern Washington Version*" (revised October 2012) should be incorporated into the regulations.

Table 3. Science-based wetland buffers for Category III and IV wetlands.

Wetland Category	Standard Buffer Width	Additional buffer width if wetland scores 21-25 habitat points	Additional buffer width if wetland scores 26-29 habitat points	Additional buffer width if wetland scores 30-36 habitat points
Category III (all)	60 ft	Add 30 ft	Add 60 ft	NA
Category IV (all)	40 ft	NA	NA	NA

Wetland Mitigation Ratios

The proposed 1:1 mitigation ratio for all wetlands and buffers will result in net loss of ecological functions, as described in the cumulative impacts analysis. In order to address that deficiency in the SMP, the following table of mitigation ratios from Ecology's *Wetlands & CAO Updates: Guidance for Small Cities Eastern Washington Version*" (revised October 2012) should be incorporated into the

regulations (Table 4). These mitigation ratios are a simplified version of a package of acceptable ratios developed by the U.S. Environmental Protection Agency, the U.S. Army Corps of Engineers, and the Washington Department of Ecology.

Table 4. Science-based recommended wetland mitigation ratios.

Category and Type of Wetland	Creation or Re-establishment	Rehabilitation	Enhancement
Category I: Bog, Natural Heritage site	Not considered possible	Case by case	Case by case
Category I: Mature Forested	6:1	12:1	24:1
Category I: Based on functions	4:1	8:1	16:1
Category II	3:1	6:1	12:1
Category III	2:1	4:1	8:1
Category IV	1.5:1	3:1	6:1

The 1:1 ratio would be acceptable for buffer impacts only, unless temporal loss is significant, in which case 1.5:1 may be more appropriate.

The City may wish to consider adding a provision in the regulations that allows optional use of the “Credit-Debit” method for determining appropriate mitigation on a very wetland-specific basis, rather than the Category- and area-specific basis identified above. Depending on the particular conditions of the impacted wetland, the required mitigation under the Credit-Debit method may be lesser or greater than the ratios provided above. See <https://fortress.wa.gov/ecy/publications/publications/1106015.pdf> for more information.

Docks

Under full build-out conditions under the proposed SMP, the number of docks on Moses Lake would approximately double. Despite standards to minimize the impacts of docks and mitigation required by the SMP, on a cumulative basis, the proliferation of docks within the City may result in the fragmentation of emergent and riparian habitats over time, representing a net loss of ecological function.

One approach to limit the number of new docks is to require the use of joint or community docks for residential parcels subdivided after the effective date of the SMP (also as required by WAC 173-26-231(3)(b)). The SMP could also require that existing parcels without docks investigate the potential for joint-use docks with neighbors prior to constructing an individual dock. Another option to

minimize the cumulative effects of new piers is to require replacement piers to come into conformance with standards for new piers. This provision would reduce the impact of existing piers (particularly those built parallel to the shoreline), offsetting the impact of new piers elsewhere in the City.

Sand Dunes

Inland sand dunes in Washington state are currently threatened by a number of practices, including conversion to residential lots. As noted in a Washington Department of Natural Resources document, "Residential properties are present on the Moses Lake... sand dunes. During these surveys, unconverted lots were also for sale. Landscaping around these homes typically includes sand stabilizing trees, and other non-native plants and often lawns" (2007).

In order to minimize adverse effects of future residential development on the unique habitat in the Shoreline Residential – Dunes Area environment designation, we recommend establishing a suite of performance standards that would accomplish the following:

1. limit the density of any new residential development (establish large minimum lot sizes and large minimum waterfront lot frontages),
2. limit site impervious surface coverage,
3. require placement of the residence in that portion of the site that has the greatest level of current alteration or has the least ecological impact,
4. prohibit clearing of all on-site native vegetation other than what may be required for construction of the residence and necessary appurtenances,
5. require native landscaping, and
6. prohibit creation of formal lawn areas.

Under the proposed SMP, the Shoreline Residential – Dunes Area environment designation allows planned developments through a Shoreline Substantial Development Permit. We recommend that any residential development in the Shoreline Residential - Dunes Area environment be a Shoreline conditional use, which would ensure that any potential development demonstrate no net loss on an individual project basis. Although residential development is currently prohibited in the Natural environment designation, one option may be to allow residential development as a shoreline conditional use, and incorporate the Shoreline Residential-Dunes Area environment into the Natural environment designation.

References

- Sheldon, D., T. Hruby, P. Johnson, K. Harper, A. McMillan, T. Granger, S. Stanley, and E. Stockdale. March 2005. Wetlands in Washington State - Volume 1: A Synthesis of the Science. Washington State Department of Ecology. Publication #05-06-006. Olympia, WA.
- Washington Department of Ecology. 2012. Wetlands & CAO Updates: Guidance for Small Cities Eastern Washington Version. Publication No. 10-06-001
- Washington Department of Natural Resources. 2007. Conservation Strategy for Washington State Inland Sand Dunes. Prepared for United States Bureau of Land Management.

Appendix A: Examples of SMP Permitting Incentives from the City of Chelan and the City of Bothell

Excerpt from City of Chelan Draft SMP

11. Mitigation Plan. Applicants seeking a reduced buffer must submit a mitigation plan that addresses the specific habitat components and/or ecological functions that may be lost as a result of the proposed reduction. Mitigation plan elements, including monitoring and maintenance, shall be included in the plan consistent with mitigation plan requirements outlined in the City of Chelan critical areas regulations (see Appendix B). Plan elements may include one or more of the mitigation options provided in the chart below to achieve an equal or greater protection of ecological functions:

Shoreline Setback Reduction Options		Shoreline Residential - SF		Shoreline Residential – Multi-Family Lake Chelan	Shoreline Residential –Chelan River and Shoreline Park/Public
		Tier 1	Tier 2		
Water Related Conditions or Actions					
1	Existing hard structural shoreline stabilization may receive the reduction allowance if it is removed and replaced with non-structural or bioengineered soft structural shoreline stabilization measures located at, below, or within 5 feet landward of the OHWM along at least 75 percent of the linear shoreline frontage of the subject property. If this option is selected, the applicant is not eligible for future hard structural shoreline stabilization. This option cannot be used in conjunction with Option 2 below.	20’	3’	6’	20’
2	Existing hard structural shoreline stabilization may receive the reduction allowance if it is removed and replaced with non-structural or bioengineered soft structural shoreline stabilization measures located at, below, or within 5 feet landward of the OHWM along at least 25 percent of the linear shoreline frontage of the subject property. If this option is selected, the applicant is not eligible for future hard structural shoreline stabilization. This option cannot be used in conjunction with Option 1 above.	20’	2’	4’	20’
3	Existing hard structural shoreline stabilization measures are removed and new shoreline stabilization measures are set back from the OHWM more than five (5) feet and/are sloped at a maximum 3 vertical (v): 1 horizontal (h) angle to provide dissipation of wave	30’	2’	4’	30’

Shoreline Setback Reduction Options		Shoreline Residential - SF		Shoreline Residential – Multi-Family Lake Chelan	Shoreline Residential – Chelan River and Shoreline Park/Public
		Tier 1	Tier 2		
	energy and increase the quality or quantity of nearshore habitat. This reduction option shall include bio-engineered shoreline stabilization measures. Option 3 may not be combined with Options 1 or 2 above.				
4	Implement any other enhancement measure indicated by the Shoreline Restoration Plan, to an extent proportional to the proposed project's impacts.	5'	1'	2'	5'
5	<p>Develop and implement a native vegetation enhancement plan in the shoreline buffer that achieves the following.</p> <ul style="list-style-type: none"> • Native shrubs planned to provide at least 50% aerial coverage of the buffer enhancement area within 5 years of installation; • Vegetation enhancement is maintained for the duration of the use or facility. <p>Note: Vegetation installed in the buffer as required mitigation for a shoreline stabilization measure or over-water structure proposal may not be counted towards this mitigation option.</p>	10'	1'	2'	10'
6	<p>Develop and implement a native vegetation enhancement plan that achieves the following.</p> <ul style="list-style-type: none"> • Native shrubs planned to provide a wildlife corridor extending upland and perpendicular to the OHWM at least a minimum width of 10 feet and a minimum length of 75 feet or full depth of the lot, whichever is greater, and planned to have 80% aerial coverage within 5 years of installation. • Vegetation enhancement is maintained for the duration of the use or facility. <p>Subdivisions that include both waterward and upland lots in shoreline jurisdiction should plan and plant the upland parcels such that a continuous wildlife corridor extends upland of the waterfront lot.</p>	5'	1'	1'	5'
7	Installation of pervious material for at least 50 percent of all new or replaced pollution-generating surfaces, such as driveways, parking or private roads, that allows water to pass through at rates similar to or greater than pre-developed conditions.	5'	1'	1'	5'
8	Restoring or preserving native vegetation within at least 50 percent of the total lot area remaining outside of the	5'	1'	1'	5'

Shoreline Setback Reduction Options		Shoreline Residential - SF		Shoreline Residential – Multi-Family Lake Chelan	Shoreline Residential –Chelan River and Shoreline Park/Public
		Tier 1	Tier 2		
	reduced buffer, the developed footprint, and outside of any critical areas and their associated buffers. The mitigation plan shall address temporal loss. This reduction is not allowed if riparian vegetation removal would be needed inside the standard buffer to accomplish the development.				
9	Implement any other enhancement measure indicated by the Shoreline Restoration Plan, to an extent proportional to the proposed project's impacts.	5'	1'	1'	5'

Excerpt from City of Bothell Final SMP

1) Decreased Standard Stream Buffer Widths

- i. As a means of increasing the ecological functions of shoreline and stream buffers that are determined to be degraded or adversely altered by past development or activities, new or substantial re-development may request buffer enhancement in exchange for a reduced buffer dimension pursuant to this section (13.13.060.E(6)). The critical areas report must include a site-specific assessment of the conditions that demonstrate an evaluation of the buffer as “degraded.”
- ii. Reduction of standard stream buffer widths are permitted only within properties with an environment designation of Shoreline Residential or High Intensity/High Intensity-Park and only when the City characterizes the buffer as degraded as defined in 13.03.
- iii. If meeting the criteria in 6)i and 6)ii above, the standard buffer width may be reduced up to a maximum of 40 percent on Type S streams, and up to a maximum of 25 percent on type F, Np or Ns streams, with the implementation of one or more of the buffer reduction options provided in Table 13.13.060-3. Buffer width reduction is measured perpendicular from the OHWM.
- iv. If the proposed buffer reduction results in loss of native trees or shrubs and the applicant is not proposing to utilize buffer reduction option 1, the applicant must provide replacement native trees and shrubs at a 2:1 ratio by number of impacted trees or shrubs in addition to meeting the requirements of the selected buffer reduction option.

Table 13.13.060-3. Buffer Reduction Options Applicable to SR and HI/HI-P Environments

Buffer Reduction Option		Allowed Buffer Width Reduction ^a	
		Sammamish River	All other streams
1	Develop and implement a City-approved shoreline native vegetation enhancement plan that achieves the following. <ul style="list-style-type: none"> • At least five (5) trees (conifer or deciduous) per 100 linear feet of shoreline; • Native trees and shrubs shall be planted along 80 percent by length of the waterbody frontage, at a planting density that will provide at least 60% areal tree and shrub coverage of the buffer enhancement area within 3 years of installation. Native groundcovers shall provide up to 30% areal coverage of the buffer enhancement area within 3 years of installation. Landscape plans shall demonstrate that the selected plantings 	1-foot reduction in buffer width for every two feet (measured perpendicular to the OHWM) of vegetation enhancement area ^{b, c}	1-foot reduction in buffer width for every three feet (measured perpendicular to the OHWM) of vegetation enhancement area ^{b, c}

Buffer Reduction Option		Allowed Buffer Width Reduction ^a	
		Sammamish River	All other streams
	<p>have the ability to provide 100% coverage of the buffer enhancement area at vegetation maturity.</p> <ul style="list-style-type: none"> • Trees are placed to shade and/or overhang the watercourse. • Vegetation enhancement is maintained for the duration of the use or facility. <p>The remaining 20% of waterbody frontage may be maintained for access to the water or to over-water structures as either lawn, native groundcover, pervious pathway, or other natural or pervious materials. The City may approve, on a case by case basis, enhancement plans that include the removal of terrestrial and aquatic invasive species provided that best management practices are taken to control erosion and minimize exposure of toxic materials. Note: Vegetation installed in the buffer as required mitigation for a shoreline/stream bank stabilization or over-water structure proposal shall not be counted towards this mitigation option. See Figures 13.13.060-2a, 2b, and 2c.</p>		
2	<p>Remove an existing hard structural shoreline or stream bank stabilization measure located at, below, or within 5 feet landward of the OHWM along at least 75 percent of the linear waterbody frontage of the subject property, and restore to a natural or semi-natural state, including restoration of topography and substrate composition. Any upland areas disturbed by this option must be revegetated with native trees, shrubs and groundcovers. Assessment and design by a qualified professional, consistency with other SMP performance standards as appropriate (e.g. shoreline stabilization in BMC 13.11.150) and applicable state and federal permits are required. This option cannot be used in conjunction with Option 4 below. See Figure 13.13.060-3a.</p>	40% reduction	40% reduction on North and Swamp Creeks, 25% on other streams
3	<p>Existing hard structural shoreline or stream bank stabilization measures are set back from the OHWM more than five (5) feet and/are sloped at a maximum 3 vertical (v): 1 horizontal (h) angle to dissipate flows and increase the quality of aquatic habitat. Assessment and design by a qualified professional is required, and applicable state and/or federal permits may be required. See Figure 13.13.060-3b.</p>	25% reduction	25% reduction
4	<p>Install woody debris where doing so would provide significant improvement to instream habitat conditions. The material shall be sized and placed to remain stable in high flow conditions, and to enhance instream habitat conditions. Assessment and design by a qualified professional is required, and applicable state and/or federal permits may be required.</p>	NA	20% reduction

Buffer Reduction Option		Allowed Buffer Width Reduction ^a	
		Sammamish River	All other streams
5	For properties with existing docks, replace ramp decking and decking that is not immediately over floats with grated decking to allow light penetration to the water. Applicable state and/or federal permits may be required	5% reduction	NA
6	<p>Install Low Impact Development facilities in locations where such facilities are not required by the Bothell Design and Construction Standards. The facilities shall be designed to meet the requirements of the City of Bothell Surface Water Design Manual standards in effect at the time, and should be located outside of buffers except when retrofitting existing improvements inside of the buffer. These facilities include:</p> <ul style="list-style-type: none"> • biofiltration/infiltration mechanisms (e.g., rain gardens, bioswales) in lieu of piped or surface discharge to the waterbody, • pervious material for 50 percent of all new pollution generating surfaces, such as driveways, parking or private roads, or replace 50 percent of existing pollution generating surfaces with pervious materials that allows water to pass through at rates similar to pre-developed conditions • Install oil-water separator(s) to remove hydrocarbons from parking areas, roads or driveways that would otherwise discharge stormwater runoff to a waterbody without treatment. 	<p>1 technique 5% 2 techniques 10% 3 techniques 20%</p>	
7	Restore at least 20 percent of the gross lot area located outside of the buffer and any critical areas and their associated buffers as native vegetation. See Figure 13.13.060-4.	10% reduction	
8	An enhancement project or measure as contained within the Shoreline Restoration Plan, provided the measure would result in a net improvement in ecological function of the waterbody or drainage basin within which the impact would occur.	Commensurate with the scale of the project, as determined by the Shoreline Administrator and as supported by the critical areas report.	

Table Notes:

- Buffer reduction measured perpendicular to the OHWM
- Minimum enhancement area averaging 10 feet in width from the OHWM.
- For properties with existing native woody vegetation coverage greater than 50% by area of the applicable standard buffer, allowed buffer reduction widths will be commensurate with the amount of proposed shoreline enhancement as determined by the Shoreline Administrator.